

# GUIDE TO YOUR YAMAHA SOLO SYNTHESIZER SY-1



## INTRODUCTION



Welcome to the musical world of Yamaha. We at Yamaha appreciate your confidence in Yamaha products, and we will do everything we can to make sure your new purchase, the Yamaha Solo Synthesizer SY-1, provides a lifetime of enjoyment.

The Solo Synthesizer SY-1 is one of the world's newest and most advanced musical instruments. Its design provides a unique combination of simplicity of operation with nearly limitless versatility. At the flip of a lever, 26 realistic instrumental tones plus two additional space age tones ("Funny" and "Pulsar") are immediately available. Real-time performances are easily duplicated and the confusion of re-registration between musical selections is eliminated.

The SY-1 Solo Synthesizer is not limited to the 28 voices we just mentioned. Each voice can be modified to produce an almost infinite variety of tonal patterns. Most of the terms you may have heard relating to synthesizers — i.e., envelope control, attack bend, touch response, resonance, portamento, etc. — are available to you the performer. These will be covered a little later in detail.

# CONTENTS



	PAGE
PRECAUTIONS .....	2
CONNECTIONS .....	3
THIS IS YOUR YAMAHA SOLO SYNTHESIZER SY-1 .....	4 - 5
KEYBOARD .....	6
TUNING .....	6
PRESET TONE LEVERS .....	7
VARIABLE EFFECT CONTROLS .....	8
FILTER .....	9
ENVELOPE .....	9
VIBRATO .....	9
PULSE WIDTH .....	10
PORTAMENTO .....	10
ATTACK BEND .....	10
TOUCH CONTROLS .....	11
MASTER VOLUME .....	12
FOOT CONTROLLER .....	12
SPECIFICATIONS .....	13

## PRECAUTIONS



The line voltage available at the AC wall outlet may differ from one area to another. While models exported to the U.S.A., Canada, Europe, and Australia are preset prior to shipment, you should check the voltage selector setting before the unit is plugged in. The voltage settings available are — 110, 130, 220, and 240V. (The 150V and 260V positions are not internally connected.) *If the line voltage selector plug is properly set,*

*make sure the SY-1 power switch is "off".* The power cord may now be plugged in. When inter-connecting the SY-1 to a companion unit (or any other comparable inter-connecting of devices), it is advisable that the units be either "off" or unplugged. This precludes any chance of shock hazards or high level transient signals that can cause equipment damage.



# CONNECTIONS



You can use your SY-1 Synthesizer connected either to an electronic organ, such as the Yamaha Electone, or with almost any amplifier system. There are two output pin jacks and one phone type output jack to facilitate inter-connections. These jacks, located on the rear panel, have an output level of 0.8Vrms and an impedance of 600 ohms. See page 5 for illustration.

## CONNECTION WITH ORGAN

When you are using your SY-1 with an organ, connect a cord between the pin output jack marked "NON-EXP" (NON-EXPRESSION) 24 on your SY-1 and the input jack marked "EXT IN" (EXTERNAL INPUT) on your organ, and set the expression/non-expression switch 23 to the "NON-EXP" position.

**NOTE:** The circled numbers correspond to the callouts for SY-1 Solo Synthesizer controls and features illustrated on pages 4 and 5.

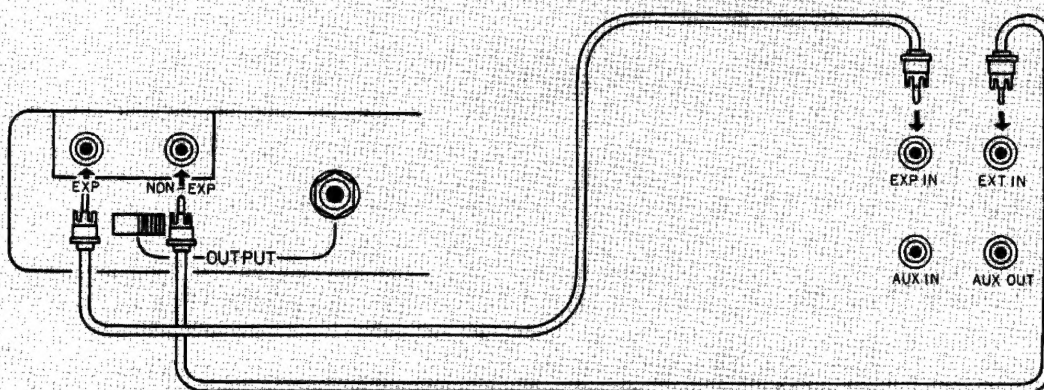
If your organ has an input jack marked "EXP IN" (EXPRESSION INPUT), connect a cord between

the "EXP" (EXPRESSION) pin output jack 22 on your SY-1 and the EXP IN jack on your organ, then set the expression/non-expression switch to the EXP position. You will then be able to change the volume of your Solo Synthesizer with the expression pedal on your organ. If this type of connection is desired and your organ does not have an "EXP IN" jack, consult your local dealer.

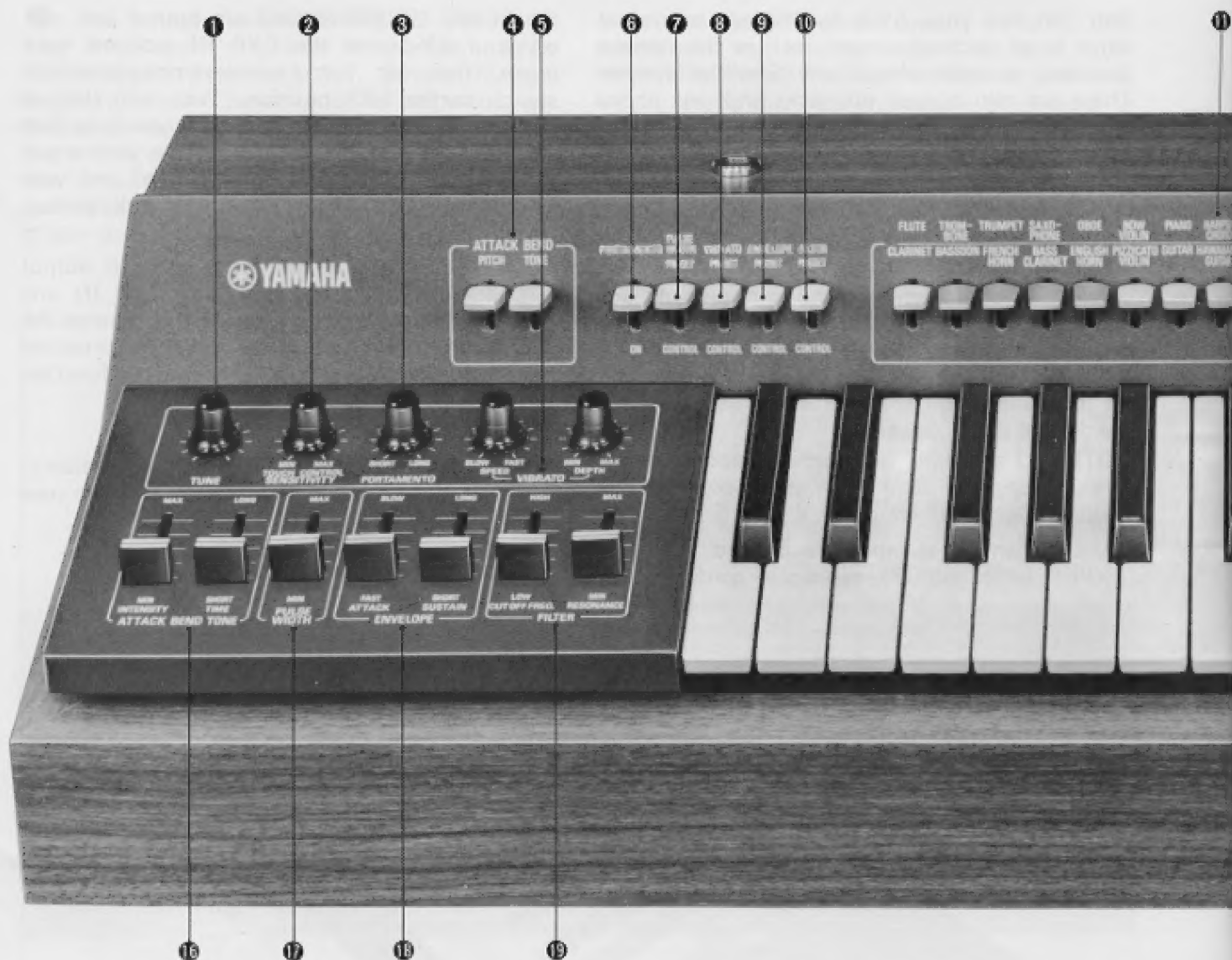
When your organ is connected to both output pin jacks of the SY-1 (EXP to EXP IN and NON-EXP to EXT IN), you can then change the expression mode by simply sliding the expression/non-expression switch to the desired function position.

## FOOT PEDAL JACK

To use the foot pedal (an optional accessory) with the Yamaha Solo Synthesizer, refer to page 12.



# THIS IS YOUR YAMAHA SOLO SYNTHESIZER SY-1



- |                                    |   |                                     |
|------------------------------------|---|-------------------------------------|
| ① Tuning Control                   | ①② Side I/Side II Lever                           | ②① Power Switch                     |
| ② Touch Sensitivity Control        | ①③ Transposition Levers                           | ②② Expression Output Jack           |
| ③ Portamento Control               | ①④ Touch Control Levers                           | ②③ Expression/Non-Expression Switch |
| ④ Attack Bend Levers               | ①⑤ Master Volume Control                          | ②④ Non-Expression Output Jack       |
| ⑤ Vibrato Controls (Speed & Depth) | ①⑥ Attack Bend Controls (Tone)                    | ②⑤ Phone Output Jack                |
| ⑥ Portamento Lever                 | ①⑦ Pulse Width Control                            | ②⑥ Foot Controller Jack             |
| ⑦ Pulse Width Lever                | ①⑧ Envelope Controls (Attack & Sustain)           | ②⑦ VCF Control                      |
| ⑧ Vibrato Lever                    | ①⑨ Filter Controls (Cutoff Frequency & Resonance) | ②⑧ Volume Control                   |
| ⑨ Envelope Lever                   | ②⑦ Keyboard                                       | ②⑨ Power Cord                       |
| ⑩ Filter Lever                     |   |                                     |
| ⑪ Preset Tone Levers               |   |                                     |





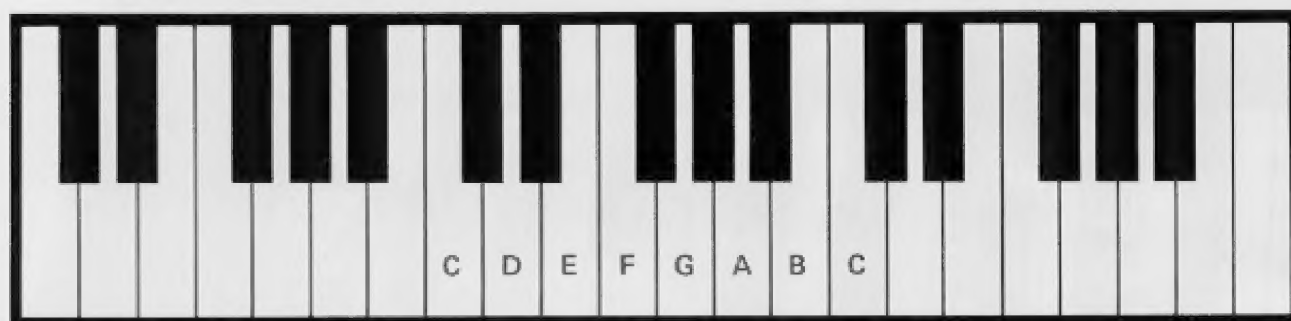
## KEYBOARD



Your Yamaha Solo Synthesizer's keyboard has 37 keys ranging from c to c<sub>3</sub>. The three transposition levers ⑬ shift the keyboard frequency range up either one or two octaves, or down one octave, that is, c<sub>1</sub> - c<sub>4</sub>, or c<sub>2</sub> - c<sub>3</sub> or C - c<sub>2</sub>. Thus, your Solo Synthesizer has a total range of six octaves (actually seven, since there are two normal pitches, depending on the preset selected). When you depress two or more transposition levers at the same time, you will hear only the one

furthest to the right on the panel. When no transposition lever is depressed, the keyboard range from c to c<sub>3</sub> is heard, as if the "normal" transposition lever was depressed.

Your Yamaha Solo Synthesizer is designed to sound only one note at a time; if you depress more than one key at the same time, you will always hear the highest note.



## TUNING



To tune your Solo Synthesizer with another instrument, wait about one minute after it is turned on. Then push down the Flute/Clarinet preset tone lever, set the vibrato lever to the "control" position and vibrato depth control to the "minimum" position to eliminate the vibrato.

Turn the "tuning control" ① at the left of the keyboard to the left (flat) or right (sharp) until you obtain the right pitch; the pitch can be raised or lowered about 100 cents (one semitone) in relation to the standard pitch.



# PRESET TONE LEVERS



Your SY-1 has 14 preset tone levers which, by switching, actually create 28 different tones. When you depress one of the levers and push a note, you hear the sound of the instrument identified by name on the lever panel, depending on the position of the side I/side II lever 12. For instance, when the Flute/Clarinet lever is depressed, you'll hear a Clarinet when the side I/II lever is pressed down or a Flute when the side I/II lever is in the up position.

Your Yamaha Solo Synthesizer is designed to

create the sound of only one instrument at a time. If you depress more than one preset tone lever at the same time, you hear only the instrument selected by the lever furthest to the right on the panel. When no levers are depressed, naturally you will hear no sound. The keyboard is designed to play only one note at a time however; no special fingering technique is required. When two or more keys are down, the higher key will have priority.

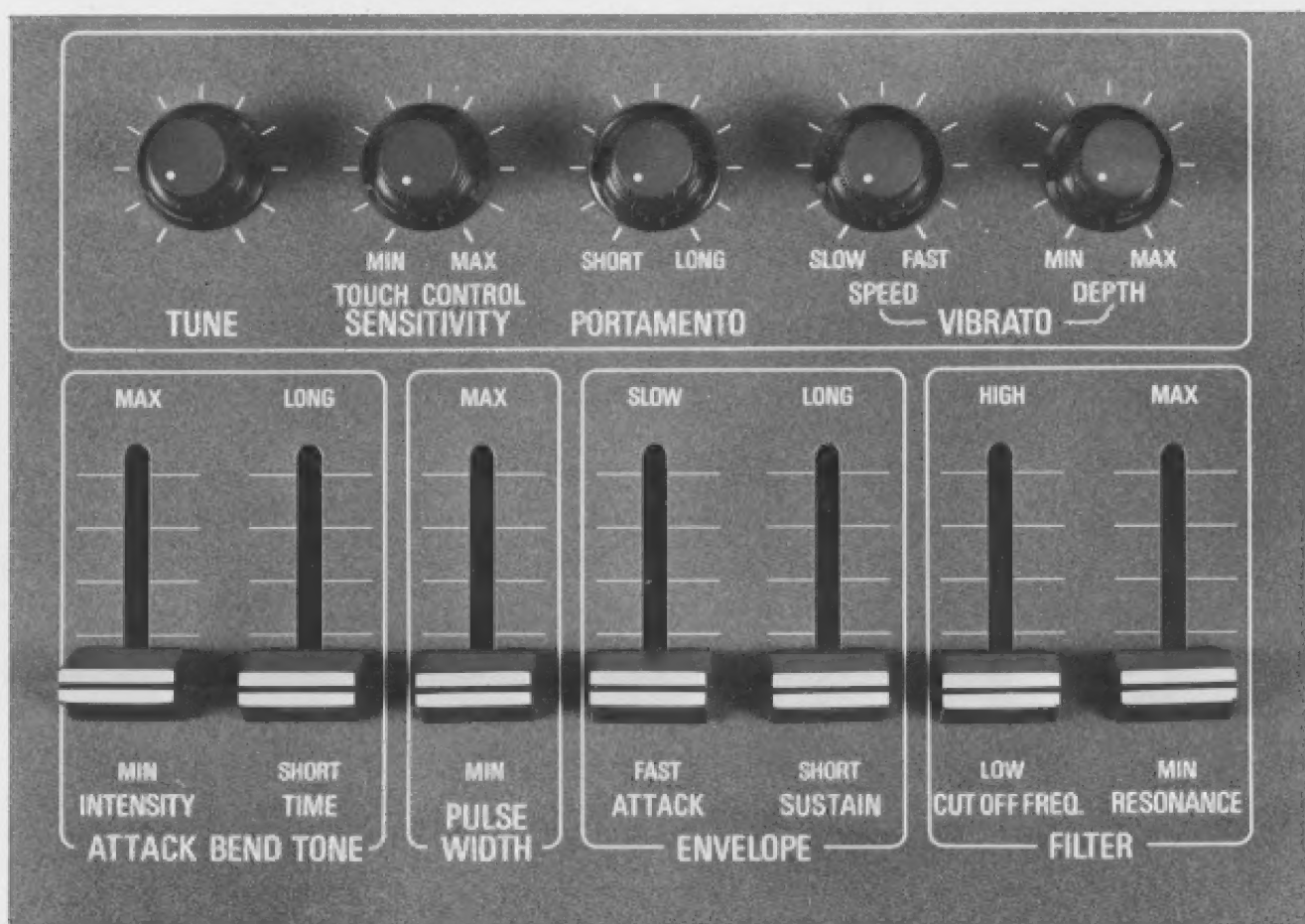
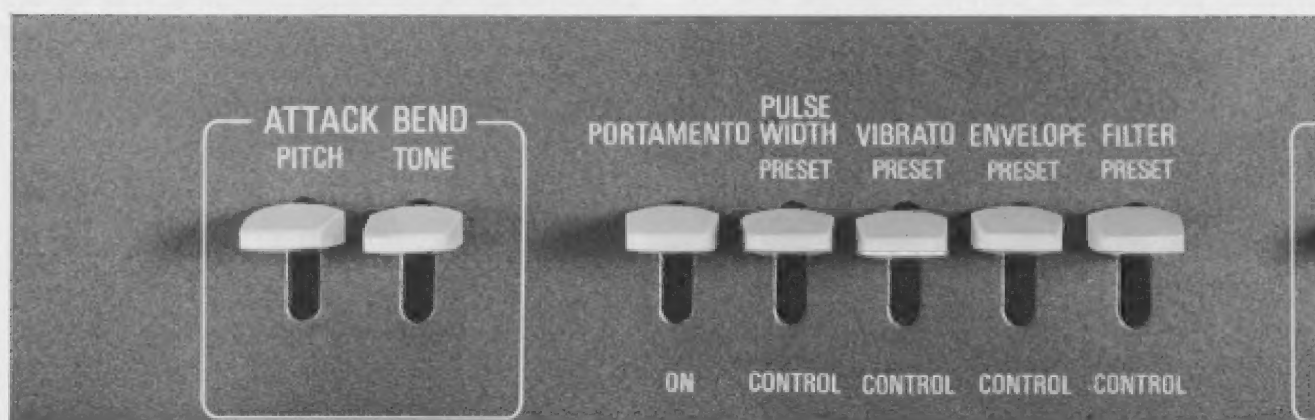


# VARIABLE EFFECT CONTROLS



Your Yamaha Solo Synthesizer has a number of variable effect controls to permit you to add variations to the preset tones and to create a new world of musical expression. For convenience, all the effect variation levers are arranged to the left of the panel, while the effect controls are

arranged at the right of the keyboard. To introduce them, depress the corresponding effect levers. These effects can be combined in any combination. A little experimentation will open many — almost infinite — possibilities to you.

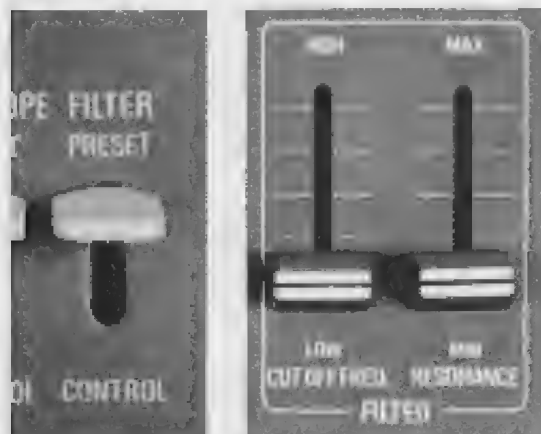


### FILTER 10 19

Simply stated, a filter alters the harmonics contained in a note to change its color or timbre. Each of the preset tones has as a design feature the characteristic harmonic structure and resonant points that identify a particular instrument.

Switch the filter to manual control and put the filter lever 10 in the "control" position (down). You can now control the filter characteristics (from lowpass to highpass, and degree of resonance) with the cutoff frequency and resonance controls 19.

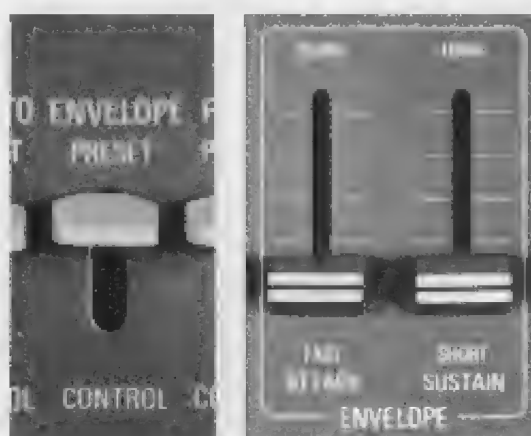
The closer the cutoff frequency control is to the high position, the more harmonics are allowed to pass through the filter resulting in a very brilliant sound. When you slide the cutoff frequency control from "low" to "high" while holding a key down, the sound you hear changes from soft and muted to bright and crisp. In the meantime, the closer the resonance control is to the maximum position, the more nasal the sound becomes, emphasizing the frequency just before cutoff. When you set the resonance control in its center position, you can create a wah-wah effect by sliding the cutoff frequency control back and forth.



### ENVELOPE 9 18

The term "envelope" may seem strange, however, every sound event has an envelope. If you draw a heavy line connecting the peaks of the sounds' waveform, you would have the event, or "envelope" waveform. Synthesizers employ separate envelope generators with a varying number of controls to adjust the different portions of the envelope wave shape. The Yamaha SY-1 preset voices all have preset attack and sustain envelope patterns. In the preset position, the "attack" (the time required for a note to reach full volume) and the length of time the note sounds (sustain and release) are adjusted for you in

advance. By placing the envelope lever 9 in the control position, the preset envelope is cancelled and the variable attack and sustain controls 18 are now functional. When the attack control is set to "slow", a long rise time results. When the sustain control is set to "long" the tone will continue to sound for quite some time after the key is released. Conversely, when the controls are set to fast and short, a staccato tone will result.



### VIBRATO 5 8

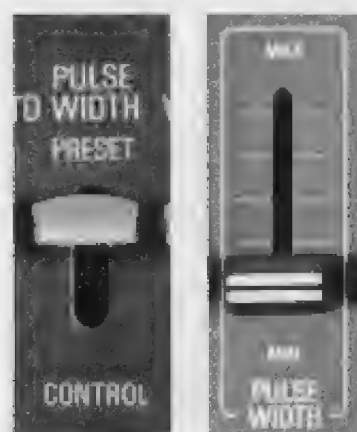
The effect called "vibrato" is a familiar one to almost every one involved in music. The term actually indicates a change in frequency, both above and below the normal pitch of the note. This change is quite small and is not to be confused with other effects. Control 8 cancels the preset vibrato included in some of the preset voices, i.e., flute, trumpet, bow violin, oboe, etc., and enables the performer to adjust the rate (speed) and depth to their own taste. Controls 5 are for speed (rotation in the clockwise direction causes a faster vibrato rate) and for depth (rotation in the clockwise direction increases the amount of change in pitch).



Note: The rate of "wah-wah" included in tones of "funny" and "wah guitar" as a preset part of the voice, can be altered using the vibrato controls. Place the vibrato lever **8** to "control" position, set the vibrato depth control (section **5**) to the minimum (counterclockwise) position. You can now adjust the vibrato speed control to obtain the desired rate of wah without introducing a vibrato effect.

### PULSE WIDTH **7 17**

The pulse width control is used to vary the ratio of pulse height to width. A square wave is one form of pulse which in this case has a ratio of 50% height and 50% width — hence the name square wave. The tone quality of this wave shape is very clarinet like. Reducing the width of the pulse will alter the tone quality in a slightly different manner than that performed by a filter. When the pulse width is very narrow, the resulting tone will be bright and rather nasal.



### PORTAMENTO **3 6**

The term "Portamento" is a latin musical notation used to indicate a sound gliding continuously from some selected note (frequency) to a second selectable point, sounding all the intermediate frequencies. This effect is designed to function between any two keys played in sequence, either higher or lower, when the portamento lever **6** is depressed. The time required for the pitch to shift from the first note played to the second (oscillator slew rate) is controlled by the portamento control **3**. Turning the control "clockwise" increases the time required for the pitch to reach the normal pitch of the second key played. Conversely, counterclockwise rotation results in a very short period (fast slew rate).

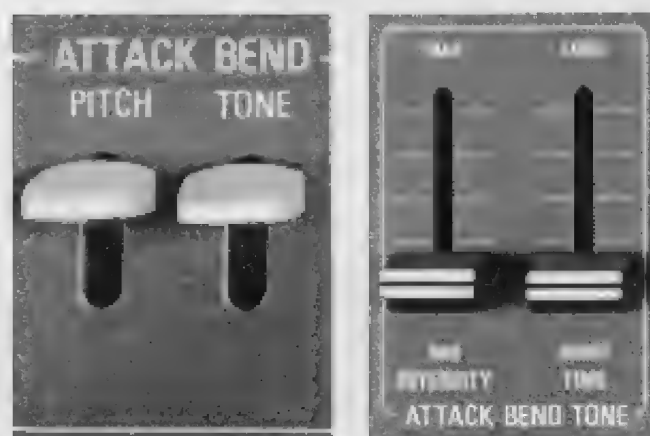


### ATTACK BEND **4 16**

Attack bend has two levers: the pitch bend that lowers a note a little in pitch the moment it is pressed and the tone bend that changes the timbre in conjunction with the intensity and time controls.

With the pitch bend lever (section **4**) depressed, a note will be lower by about 100 cents (one semitone) in pitch the moment a key is depressed, then return to the normal pitch gradually. The pitch to which the note is lowered and the time it takes for it to return to its normal pitch are preset.

The tone bend intensity control (section **16**) alters timbre by adjusting the extent to which a note changes in tone. The tone bend time control (section **16**) adjusts the time it takes for a note to reach its intended sound after the key is pressed.



## TOUCH CONTROLS



Your Yamaha Solo Synthesizer is equipped with special touch controls that adjust the vibrato depth, wah-wah and volume in direct proportion to the downward pressure on the keys.

There are three levers to the right of the panel and next to the master volume control: vibrato depth, wah-wah and volume ④. There is also a sensitivity control ② at the left of the keyboard that adjusts the overall effect of the touch controls. When the vibrato depth lever is depressed, and a

key is played lightly, you hear almost no vibrato. When you press the key harder, the vibrato effect will increase. You can adjust the sensitivity of this effect with the sensitivity control.

All of the touch-sensitive effects can be used in combination with each other. For example, when the vibrato depth and volume levers are depressed, a subtle change in finger pressure on a note alters both the vibrato depth and the volume.





## MASTER VOLUME



The master volume control ⑮ adjusts the overall volume of your Yamaha Solo Synthesizer so you can achieve a balance in volume between your Solo Synthesizer and other instruments.



## FOOT CONTROLLER



The Yamaha Synthesizer, SY-1, rear panel has a jack designed to accept a control operated by the foot ⑳. Connection is a simple plug-in with no additional wiring required.

The foot controller is designed to control volume, timbre, or both at the same time. The VCF (voltage controlled filter) (control ㉑) determines

the amount of timbre change the pedal manipulation can provide. The volume control ㉒ adjusts the amount of change in volume available when using the foot controller. Proper settings can provide many interesting sounds including wah-wah.



# SPECIFICATIONS



**KEYBOARD** 37 keys c ~ c3 (3 octaves)

## PRESET TONE LEVERS

### Side I

Flute  
Trombone  
Trumpet  
Saxophone  
Oboe  
Bow Violin  
Piano  
Harpsichord  
Contrabass  
Tuba  
Bass Guitar  
Funny  
Trumute  
Double

### Side II

Clarinet  
Bassoon  
French Horn  
Bass Clarinet  
English Horn  
Pizzicato Violin  
Guitar  
Hawaiian Guitar  
Pizzicato Bass  
Sousaphone  
Wah Guitar  
Pulsar  
Growlpet  
Reed

Side I/Side II Selector

## FILTER CONTROLS

Preset/Control Selector  
Cutoff Frequency  
Resonance

## ENVELOPE CONTROLS

Preset/Control Selector  
Attack  
Sustain

## VIBRATO CONTROLS

Preset/Control Selector  
Speed  
Depth

## TRANSPOSITION LEVERS

One Octave Down  
Normal  
One Octave Up  
Two Octaves Up

## TOUCH CONTROLS

Vibrato Depth (On/Off)  
Wah-Wah (On/Off)  
Volume (On/Off)  
Sensitivity

## ATTACK BEND CONTROLS

Pitch (On/Off)  
Tone (On/Off)  
Intensity (Tone)  
Time (Tone)

## PORTAMENTO CONTROLS

On/Off Selector  
Time

## PULSE WIDTH CONTROLS

Preset/Control Selector  
Width

## OTHER CONTROLS

Tune  
Master Volume

## OTHER FITTINGS

Outputs  
Expression Jack  
Non-Expression Jack  
Expression/Non-Expression Switch  
Phone Jack  
Power Switch  
Pilot Lamp  
Foot Control  
Jack  
Volume  
VCF  
Music Rest  
Height-Adjustable Rear Legs

## CIRCUITRY

Solid State  
Power Consumption: 20 Watts  
Power Source: AC, 50/60Hz

## DIMENSIONS

Width: 78cm (30¾")  
Depth: 28cm (11")  
Height: 16.5cm (6½")

**WEIGHT** 12kg (26 lbs.)

**FINISH** American Walnut Grain

## OPTIONAL ACCESSORIES

Stand  
Foot Pedal  
Carrying Case

*Specifications subject to change without notice.*

SINCE 1987  **YAMAHA**  
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN